EXHIBIT 16

Enclosure (1)

Preliminary LLE Incident Report **Number 125**

Area: OMEGA Target Bay

Key Words: personal injury
High Yield Neutron Temporal Diagnostic

1. **DESCRIPTION of INCIDENT**: (describe what happened including indications and the results of the investigation)

At 1824h on 6 August 2008 a serious personal injury occurred in the OMEGA Target Bay while an experimental campaign entitled DT ratio with Dr. H. Herrmann of Los Alamos National Laboratory (LANL) as the lead Principal Investigator (PI) was being conducted. Subsequent to shot 52072, the diagnostic co-PI for the High Yield Neutron Temporal Diagnostic (HYNTD), commonly referred to as the Light-Pipe, that was being operated in the gas (CO_2) Cherenkov mode, requested that the CO_2 pressure be reduced from 100 psig to 50 psig. A Senior Laboratory Engineer (SrLE) who was not an assigned OMEGA watch stander was tasked by the diagnostic co-PI to reduce the pressure. The SrLE tasked does not normally perform this function, but he indicated he knew how to do it, and he proceeded to the Target Bay to perform the pressure reduction.

During this action, four other personnel in the Target Bay (two assigned Experimental Technician watch standers, a LANL technician, and an NSTec technician), heard what was described as a loud bang, a gas pressure release, and a crashing sound. When they investigated they found the SrLE unconscious, face down, and bleeding profusely on the Target Bay floor. They observed the support structure (110 lb) for the Light-Pipe and remnants of the Light-Pipe in the vicinity. They immediately reported their findings to the Control Room and administered CPR to the victim when his breathing stopped several minutes after the event. The Shot Director called 911 and the paramedics arrived at about 1834 and took over first aid and transport to of the injured person to Strong Memorial Hospital.

The investigation revealed that the Light-Pipe structure fell from its support due the use of inadequate mounting bolts (three ¼ inch bolts rather than the apparent design intent of five ½ inch bolts).

2. **IDENTIFICATION OF APPARENT CAUSE**

X Personnel **X Procedure** **_____Equipment** **_____Material**

This incident was caused by the failure to rigorously follow the procedures of LLEINST 7700 Design and Integration of Equipment, and the failure of management to comply with the requirements of LLEINST 3000 Laser Facility Organization and Regulation Manual that requires all new diagnostics be fully qualified two weeks before the date of an experiment. Additionally, the mechanical design and assembly of the Light-Pipe diagnostic was not thorough, and it was assembled and installed by inexperienced and unqualified personnel. Contributing to this incident was a serious drain of resources caused by the

simultaneous construction of the OMEGA EP project while at the same time continuing to operate OMEGA. Specifically:

- The Experimental Operations Group Leader improperly allowed "developmental diagnostics" to be exempted from completing the requirements of LLINST 7700 including final certification for operation. While the instruction allowed operation by developers under operational shot conditions, it does not allow exceptions to the fabrication, installation, and qualification phase requirements including the performance of an Operational Readiness Review. Since the Light-Pipe was exempted from the LLEINST requirements, an Operational Readiness Review that includes the preparation and completion of written fit and function tests, installation, and qualification test plans was not performed.
- The PI and project coordinator for the HYNTD project did not specify to the design engineer that the Light-Pipe would be operated at other than atmospheric pressure. Consequently, the mechanical design did not include the design and specification of the pressure control equipment.
- The Mechanical Design was deficient:
  - The assembly drawing was incomplete and did not represent the as built condition.
  - The fasteners to mount the structure to the supporting target area structure were not specified (however, there were five ½ inch holes provided on the mounting plate).
  - Two of the five ½ inch holes on the mounting plate didn't align with any of the target area structure.
  - The gas pressurization system was not included in the design.
  - The pressure cell cap assembly method at the target chamber end was not specified. Epoxy was chosen for this joint but was not analyzed by ME.
- The desire of the PI to use the diagnostic on impending OMEGA experiments coupled with the failure of management to enforce the requirement that this diagnostic be qualified two weeks before an experiment and a shortage of qualified mechanical assemblers caused the diagnostic to be assembled, installed, and operated by inexperienced and unqualified personnel. This caused:
  - The support structure to be installed with inadequate size and number of fasteners. Experimental Operations personnel participated in the installation of ¼ inch bolts in ½ inch holes but this decision was not elevated to Mechanical Engineering (ME) for analysis
  - The pressure control system to be installed without relief protection and with fittings and a regulating valve that was not rated for the industrial gas bottle pressure source.
  - The procedure to operate the pressure regulating system was not approved and was incorrect.
  - When the mounting of the support structure was questioned by the Principal Investigator, it was not brought to the attention of senior management or the Mechanical Engineering Design Group.

3. CORRECTIVE ACTIONS

a. **IMMEDIATE ACTIONS** (actions taken at the time of the incident to establish stable conditions)

(1) First aid was rendered and 911 called.

(2) Appropriate senior personnel were notified including, the Laser Facility Manager, OMEGA Facility Director, Associate Director for Operations, LLE Laboratory Director, UR Environmental Health and Safety Officer, UR President, and Administrator of the National Nuclear Security Administration.

(3) The Occupational Health and Safety Administration (OSHA) was notified

(4) The accident site was secured pending investigation.

b. **TEMPORARY CORRECTIVE ACTIONS** (actions taken to resume normal operations in advance of completion of permanent actions, identify specific actions, persons responsible, and completion due date)

(1) All potentially hazardous operations at LLE were suspended pending investigation and completion of the requisite actions to ensure the safety of all personnel.

c. **PERMANENT CORRECTIVE ACTIONS** (permanent corrective actions to prevent recurrence, identify specific actions, person responsible, and completion due date)

(1) Non OMEGA and OMEGA EP laboratories will be restarted after the completion of the requirements specified in R.L. McCrory memorandum dated 13 August 2008 (attached). This required a multistep process of reviewing safe operating procedures, group member/Group Leader safety audit of respective laboratories, safety inspection by Division Directors and safety officers, resolution of significant issues, and approval of the Laboratory Director to resume operations upon the recommendation of the appropriate Division Director.

(2) OMEGA and OMEGA EP shutdown watch condition I operations will be resumed after the completion of the requirements specified in R. L. McCrory memorandum dated 13 August 2008 (attached). This required a multistep process of reviewing safe operating procedures, group member/Group Leader safety audit of respective laboratories, safety inspection by Division Directors and safety officers, resolution of significant issues, and approval of the Laboratory Director to resume operations upon the recommendation of the OMEGA Facility Director.

(3) Restart of OMEGA and OMEGA EP watch condition II shot operations will be resumed after the completion of the following additional requirements:

(a) Identification of all experimental diagnostics that have not completed the final LLEINST 7700 Critical Equipment Qualification Checklist (CEQC) process, placing these systems out of commission, and ensuring them to be

in a safe condition. These systems will not be returned to service until the requirements are completed. The following diagnostics were identified, have been verified to be in a safe condition, and were placed out of commission:

- Active Shock Breakout Diagnostic (ASBO) – Operating and configuration procedures are required
- Charged Particle Spectrometer #1 (CPS 1) – Operating procedures are required
- Charged Particle Spectrometer #2 (CPS 2) – Operating procedures are required.
- EMP monitors (EMPMON) – CEQC review and operating procedures are required
- Neutron Diagnostic Inserter (NDI 5) – Redesign, CEQC review, and operating procedures are required.
- 351 Scatter Calorimetry (SCCAL) – Installation and operating procedures and safety review are required.
- X-Ray calorimetry (XRCAL) – installation and operating procedures and safety review are required.
- High Yield Neutron Bang Time (HYNBT) – Full CEQC completion is required.
- High Yield Neutron Temporal Diagnostic (HYNTD) – Redesign and a complete CEQC review is required.
- Neutron Fluence Array (NFA1) – Full CEQC review is required.
- Opacity X-Ray Imager (OXI) – Completed CEQC package must be approved.
- Neutron Scintillators (SSC A-G NTOF) – Mechanical configuration review, installation, inspection, and operating procedures are required.
- TIM based PCD (PCD-1) – Full CEQC completion is required.
- PJX X-Ray Streak Camera (PJX) – Ten inch (diagnostic) manipulator (TIM) installation and operating procedures are required.
- Ultra Fast X-Ray Streak Camera (UFXRSC) – TIM installation and operating procedures are required.
- H11/P11 LLNL PCDs – vacuum system operation procedures and HV interlock.
- TIM TPS (TTPS) – Install and operating procedures.

(b) All OMEGA Facility and Experimental Division personnel involved with the design, assembly, installation, or operation of critical equipment and experimental diagnostics will be trained on the following:

- The requirements of LLEINST 7700 emphasizing that no critical equipment or OMEGA experimental diagnostic will operated until the completion of all requirements including final inspection by qualified inspectors and completion of an Operational Readiness Review.
- Only qualified on watch operators will operate OMEGA facility equipment with the exception that diagnostic specialists may startup and acquire data from self contained equipment such as streak cameras.
- Equipment will only be installed in the OMEGA facility by qualified personnel designated by the OMEGA Facility and Functional Engineering Group Leaders.

(c) LLE instruction will be revised to include a risk assessment and an inspection by the appropriate functional engineering group of all installations with emphasis on those areas with a risk other than zero.

(d) No new or modified experimental diagnostic will be operated unless all of the requirements of LLEINST 7700 have been completed and all certification signatures have been obtained.

(4) The following corrective actions are not prerequisite to the restart of OMEGA but will be completed as indicated:

(a) A chief LLE Safety Officer will be designated. (**Action:** R. L. McCrory by 25 August 2008)

(b) A Mechanical Safety Officer will be designated. (**Action:** R. L. McCrory by 25 August 2008)

(c) All personnel who either design or install pressurized systems will complete a course of instruction relative to design and safety requirements. This course will be patterned after the LLNL course syllabus. (**Action:** M. Shoup by 15 December 2008).

(d) Additional corrective actions, if any, identified by OSHA and University of Rochester Environmental Health and Safety will be completed.

4. **SUBMITTED BY** Samuel Morse **Date** 8/19/08
Person Investigating the Incident

5. **REVIEWED BY** a. Keith R Thorp **Date** 8/19/08
Laser Facility Manager

b. Samuel Morse **Date** 8/19/08
Laser Facility Director

c. _____ Date 08/19/2008
Associate Director for Operations

6. APPROVED BY _____ Date 08/19/2008
Laboratory Director